AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Currently Amended) An optical scanner for installation into an electrophotographic device comprising:

a laser configured to emit a laser beam;

laser optics arranged to sweep said laser beam along a non-ideal laser beam scan path; and

scanner circuitry comprising:

a first interface operatively configured to communicate with a controller in ~~said electrophotographic device~~ a corresponding electrophotographic device to which said optical scanner is installed; and

a memory device having stored thereon, data that characterizes said laser beam scan path, wherein said data is communicated to said controller through said first interface ~~and said electrophotographic device such that~~ after installation of said optical scanner in said corresponding electrophotographic device ~~performs electronic compensation~~ such that electronic compensation of said laser beam scan path is performed by said electrophotographic device during imaging operations based upon said data.

2. (Original) The optical scanner according to claim 1, wherein said data that characterizes said laser beam scan path comprises laser beam position measurements taken at a plurality of test points, wherein process direction position errors of said laser beam scan path may be electronically compensated by said controller.

3. (Original) The optical scanner according to claim 2, wherein a scan direction measurement and a process direction measurement are taken at each of said plurality of test points.

4. (Original) The optical scanner according to claim 3, wherein a corresponding laser beam velocity measurement is taken at each of said plurality of test points, wherein laser beam scan path velocity nonlinearity may be compensated for by said controller.

5. (Original) The optical scanner according to claim 4, wherein said laser optics comprises a rotating polygonal mirror and each of said laser beam velocity measurements comprises a measure of the angle of rotation of said rotating polygonal mirror.

6. (Original) The optical scanner according to claim 3, wherein said laser beam position measurements are stored on said memory device such that said scan direction measurements for each of said plurality of test points are encoded into a first vector and said process direction measurements for each of said plurality of test points are encoded into a second vector.

7. (Original) The optical scanner according to claim 2, wherein said laser beam position measurements comprise measurements taken of said laser beam prior to said optical scanner being installed into said electrophotographic device.

8. (Original) The optical scanner according to claim 2, wherein said plurality of laser beam position measurements comprise position measurements of a test laser beam that is not part of said optical scanner.

9. (Original) The optical scanner according to claim 1, wherein said optical scanner comprises a plurality of lasers, each laser associated with a corresponding color image plane, wherein a plurality of laser beam position measurements comprises a plurality of laser beam position measurements for each of said lasers.

10. (Original) The optical scanner according to claim 1, wherein said scanner circuitry comprises a second interface, said first and second interfaces configured such that said electrophotographic device communicates memory data with said memory device using said first interface and said electrophotographic device communicates image data to be printed to said laser using said second interface.

11. (Currently Amended) An optical scanner for installation into an electrophotographic device comprising:

a laser configured to emit a laser beam;

laser optics arranged to sweep said laser beam across an associated photoconductive surface of said electrophotographic device; and

scanner circuitry comprising:

a first interface operatively configured to communicate with a controller in ~~said electrophotographic device~~ a corresponding electrophotographic device to which said optical scanner is installed; and

a memory device having a plurality of storage locations thereon, wherein after installation of said optical scanner in said corresponding electrophotographic device, said controller reads operational parameters from said memory device for performing electronic compensation of non-ideal laser beam characteristics, and said controller writes operational parameters related to the operation of said electrophotographic device to said memory device using said first interface.

12. (Original) The optical scanner according to claim 11, wherein said operational parameters comprise at least one of a measure of temperature within said electrophotographic device, an operational cycle count of a component within said electrophotographic device, and a power on time count of said electrophotographic device.

13. (Original) The optical scanner according to claim 11, wherein said operational parameters comprise registration information that is typically stored by a controller in said electrophotographic device, which is mirrored to said memory device.

14. (Currently Amended) An optical scanner for installation into an electrophotographic device comprising:

a laser configured to emit a first laser beam and a second laser beam;

laser optics arranged to sweep said first laser beam across an associated photoconductive surface of said electrophotographic device;

a photodetector configured to measure the intensity of said second laser beam; and

scanner circuitry comprising:

a first interface operatively configured to communicate with a controller in ~~said electrophotographic device~~ a corresponding electrophotographic device to which said optical scanner is installed; and

a memory device having stored thereon, first data that characterizes laser beam power parameters based upon ~~previous~~ measurements taken by said photodetector before said optical scanner is installed in said corresponding electrophotographic device, wherein said first data is communicated to said electrophotographic device through said first interface and said electrophotographic device performs electronic compensation based upon said first data after said optical scanner is installed in said corresponding electrophotographic device.

15. (Original) The optical scanner according to claim 14, wherein said laser beam power parameters comprise a measure of laser differential efficiency.

16. (Original) The optical scanner according to claim 14, wherein said laser beam power parameters comprise a measure of laser beam turn on current required for said laser to conduct laser energy.

17. (Original) The optical scanner according to claim 14, wherein said laser beam power parameters comprise a measure of current supplied to said laser to achieve a predetermined level of spot power from said laser beam.

18. (Original) The optical scanner according to claim 14, wherein said laser beam power parameters comprise a constant that corresponds to a given change in input current to said laser to a change in spot power.

19. (Currently Amended) An optical scanner for installation into an electrophotographic device comprising:

a laser configured to emit a laser beam;

laser optics arranged to direct said laser beam towards an associated imaging medium of said electrophotographic device; and

scanner circuitry comprising:

a first interface operatively configured to communicate with a controller in ~~said electrophotographic device~~ a corresponding electrophotographic device to which said optical scanner is installed; and

a memory device having:

a plurality of addressable storage locations partitioned into identification, history, and manufacturing sections wherein:

said identification section comprises data stored therein that uniquely identifies said optical scanner;

said history section comprises storage locations that can be written to and read by said electrophotographic device to store data related to operating parameters of said electrophotographic device; and

said manufacturing section comprises data recorded in said memory device during manufacturing that characterizes said optical scanner such that after said optical scanner is installed in said corresponding electrophotographic device, said electrophotographic device implements adjustments to compensate for laser beam scan path characteristics unique to said optical scanner.

20. (Withdrawn) A test fixture for characterizing a laser beam comprising:

a scanning table upon which an optical scanner under test is mounted, said scanning table including a sensing area for sensing laser energy emitted by a laser beam from said optical scanner;

a host computer having software executed thereon to control testing of said optical scanner; and

an interface communicably coupled to said host computer, said optical scanner and said scanning table, said interface operatively configured to control said optical scanner under command from said host computer and communicate laser energy measurements recorded by

said sensing area to said host computer for processing, said interface further arranged to write data to a memory device on said optical scanner under test based upon said laser energy measurements.

21. (Withdrawn) The test fixture according to claim 20, wherein said interface further comprises analog to digital conversion circuitry for converting said laser energy measurements to digital information for processing by said host computer.

22. (Withdrawn) The test fixture according to claim 20, wherein said sensing area comprises a plurality of sensor arrays spaced across a scan path swept by said laser beam.

23. (Withdrawn) The test fixture according to claim 22, wherein said interface further comprises a controller operatively configured to direct said optical scanner under test to turn on and sweep said laser beam across select ones of said sensor arrays in said sensing area and said host computer is operatively programmed to determine laser beam position measurements of said laser beam at said select ones of said sensor arrays relative to a known point.

24. (Withdrawn) A method of measuring a process direction position of a laser beam comprising:

providing a plurality of sensor arrays spaced apart from one another in a scan direction, each sensor array having a plurality of cells extending generally in a process direction which is perpendicular to said scan direction, each cell configured to detect and provide a measure of laser energy that impinges thereon;

turning a laser beam of an optical scanner on and sweeping said laser beam across each of said plurality of sensor arrays;

determining where a center of said laser beam impinged upon said sensor arrays;

computing a corresponding scan direction position measurement and process direction position measurement for each of said plurality of sensor arrays; and

storing said scan direction position measurements and said process direction position measurements on a memory device of said optical scanner.

25. (Withdrawn) The method according to claim 24 further comprising:

measuring at least two coordinate points of each of said plurality of sensor arrays relative to a fixed point; and

using said coordinate points for each of said plurality of sensor arrays to compensate for skew of each sensor array relative to said process direction.

26. (Withdrawn) The method according to claim 24, further comprising for each of said plurality of sensor arrays:

collecting said measure of laser beam energy from each cell; and

performing a weighting function to determine where said center of said laser beam struck along the corresponding sensor array.

27. (Withdrawn) The method according to claim 26, wherein said weighting function for each sensor array is determined by:

detecting a first cell having the greatest energy measurement;

scaling the measurement of cells adjacent to said first cell; and

computing a position based upon an average of the energy measurements from said first cell and said cells having scaled measurements.

28. (Withdrawn) The method according to claim 24, further comprising:

determining a pel location corresponding to the position of each of said plurality of sensor arrays;

computing an angle measurement corresponding to the rotation of a polygonal mirror of said optical scanner under test based upon said determined pel location; and

storing said angle measurement for each of said plurality of sensor arrays to said memory device on said optical scanner.